

REMARKS

Claims 1-8 and 10-22 are all the claims pending in the application. Claims 1-8 and 10-16 are rejected. Claims 1, 4 and 7 are amended to clearly indicate that neither lead nor arsenic is in the glass and to state that the glass has only 0-6 percent Zn^{2+} . Claims 17-22 have been allowed. New claims 23-28 have been added, where claim 23 is essentially original claim 1 with the further limitation that neither lead nor arsenic is in the glass and to state that the F content of the glass is denoted by an anionic percentage of 25-48 percent. Dependent claims 24-28 correspond to original claims 2, 3, 5, 10 and 13. New claims 29-33 have been added, where claim 29 is essentially original claim 4 with the further limitation that neither lead nor arsenic is in the glass and to state that the F content of the glass is denoted by an anionic percentage of 25-48 percent. Dependent claims 30-33 correspond to original claims 6, 8, 11 and 14. New claims 34-37 have been added, where claim 34 is essentially original claim 7 with the further limitation that neither lead nor arsenic is in the glass and to state that the F content of the glass is denoted by an anionic percentage of 25-48 percent. Dependent claims 35-37 correspond to original claims 12, 15 and 16.

Interview

Applicants also wish to express their appreciation for the courtesy extended to the Applicants' representative in a telephone interview on April 17, 2006 in which the distinction over the prior art due to the limitation that the glass was a fluorophosphates with no arsenic and no lead was discussed. Applicants appreciate the Examiner's comments and suggestions and have further amended the claims as noted above, based on those discussions.

Charts 1 and 2

Applicants also are enclosing herewith two charts in which compositions of Examples described in the cited patents to Yamashita (Chart 1) and Oguma (Chart 2) are converted to cation and anion percents. These charts will be referenced in the subsequent discussion of each reference and the manner in which the presently claimed invention distinguishes over that reference.

As shown in Chart 1, none of the compositions of the 18 Examples described in Yamashita include F as an anionic component and none overlap with any part of the compositional ranges of cationic components that define the present invention in all of the claims, as supported by 23 Examples. Therefore, the prima-facie obviousness rejection of claims based on Yamashita should be overcome.

As shown in Chart 2, the present invention is different from Oguma in the following respects. First, each of the 18 Examples in Oguma requires a large amount of Zn^{2+} as a cationic component. By contrast, Zn^{2+} is an optional cationic component in the present invention and may range from zero to 6 cation percent. Second, only Example 17 is fluorophosphates glass. None of the other compositions contain any F content. However, the glass of Example 17 comprises As_2O_3 and PbO .

Claim Rejections - 35 U.S.C. § 103

Claims 1, 2, 4-7 and 10-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamashita (4,303,298). This rejection is traversed for at least the following reasons.

Claims 1, 4 and 7

The rejected claims include independent claims 1, 4 and 7. In each of these independent claims, the following three features are defined:

- (1) the glass is fluorophosphate glass (= phosphate glass containing fluorine);
- (2) the glass has only 0-6 percent Zn^{2+} , and
- (3) the glass essentially comprises no arsenic and lead.

As described in paragraph [0004] of the original application, the conventional near-infrared light absorbing glass that comprises fluorophosphates glass requires harmful As_2O_3 in order to correct the deterioration in transmittance at 400 nm.

By contrast, invention defined in each of independent claims 1, 4 and 7 provides near-infrared light absorbing glass comprised of fluorophosphates glass, in which good color

compensating characteristics are maintained without containing harmful arsenic. The importance of this feature is described in paragraph [0011] of the specification.

With regard to independent claim 1, the near infrared light-absorbing glass is denoted by cationic percentages of several specific materials. Independent claims 4 and 7 do not identify cationic percentages of multiple specific materials, but instead, recite physical property parameters.

Yamashita

Applicants respectfully submit that Yamashita fails to disclose or suggest at least the express claim limitations directed to two features of the invention, namely

“wherein the glass is fluorophosphates glass essentially comprising no arsenic and lead.”

The Examiner appears to focus only on the limitation that the glass comprises essentially no arsenic and lead and fails to address the fact that the claim also requires the glass to be a fluorophosphates glass. Both features must be disclosed or at least suggested. The presence of one does not suggest the other, as is clear from Yamashita’s examples.

Yamashita does appear to disclose embodiments that do not contain PbO and As₂O₃ (see for example, Abstract (showing PbO of 0-10%); col. 3, lines 62-66; and the various examples in the tables with no entry for PbO). However, there is no disclosure or even suggestion that the base glass is a fluorophosphate. Indeed, Yamashita has no teaching or suggestion of even a glass comprising fluorine. Thus, the combination of these two limitations, namely (1) a fluorophosphates glass (2) having no arsenic and no lead, is not found in Yamashita.

The only portion of Yamashita that discloses the composition of the base glass appears at col. 5, lines 15-21, which is reproduced below for the convenience of the Examiner:

Suitable raw materials for the glass of this invention are, for example, H₃PO₄, P₂O₅, Al(OH)₃, Al₂O₃, H₃BO₃, SiO₂, alkali metal carbonates, alkali metal nitrates, carbonates of Ba, Mg or Ca, nitrates of Ba, Sr or Pb, ZnO, PbO, CuO, and the like. Materials having reducibility are unsuitable for production of the glass of this invention.

One of ordinary skill in the art would not conclude, from a review of Yamashita, that any of these glasses are fluorophosphates.

Finally, the Examiner must concede that Yamashita fails to disclose a fluorophosphates glass where the glass has only 0-6 percent Zn^{2+} . This limitation has been newly added to the claims 1, 4 and 7 in order to further distinguish from the prior art.

In addition, in rejection of claims 4 and 7 in the outstanding Official Action, the Examiner comments that that the weight percent ranges disclosed by Yamashita, if converted to cation percent, would have overlapping compositional ranges of the rejected claims. However, this comment is not entirely clear, as the two independent claims do not recite weight percentage ranges. To the extent that the Examiner may be suggesting that the weight percentage ranges of the various examples in the present application and the various examples in Yamashita overlap, and thus must have similar physical properties, this suggestion is erroneous.

As already noted, the Examiner also must concede that Yamashita fails to expressly disclose the compositional and property limitations in terms of cation percent. The Examiner's assertion that, if the weight percent ranges in Yamashita were converted to cation percent, the ranges in Yamashita would overlap the claimed ranges, also would not be supported. As shown in the first chart appended to this Amendment, compositions of Examples described in Yamashita do not overlap with the compositional ranges described in the present invention. Finally, Yamashita does not teach or suggest the Zn^{2+} limitation added to the claims. Thus, there is no basis for asserting that such range is taught, or even obvious.

Based on these three limitations in each of independent claims 1, 4 and 7, they should be considered patentable over Yamashita. Similarly, dependent claims 2, 5, 6 and 10-16 should be considered patentable over Yamashita. In short, the rejection over Yamashita should be overcome.

Claims 23, 29 and 34

New claims 23, 29 and 34 are based upon original claims 1, 4 and 7, respectively, and include the limitations with regard to (1) the glass being a fluorophosphate glass (= phosphate glass containing fluorine) and (2) the glass essentially comprises no arsenic and lead. The claims should be patentable because this combination is not taught in Yamashita. Moreover, the cation percent ranges do not overlap, as demonstrated from the attached chart 1. To the extent that the Examiner asserts that the characteristics of a fluorophosphates glass is not defined, Applicants now have specified that the F content of the glass is denoted by an anionic percentage of 25-48 percent. This feature, alone or in combination with other claimed features, is not found in Yamashita.

Based on these three limitations in each of independent claims 23, 29 and 34, they should be considered patentable over Yamashita. Similarly, dependent claims 24-28, 30-33 and 35-37 should be considered patentable over Yamashita.

In short, the rejection over Yamashita should be overcome for all claims.

Claims 1-8 and 10-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Oguma (5,668,066). This rejection is traversed for at least the following reasons.

Claims 1, 4 and 7

Applicants respectfully submit that Oguma et al does not teach the three limitations that combine together to define the invention over the prior art, namely

- (1) the glass is fluorophosphate glass (= phosphate glass containing fluorine);
- (2) the glass has only 0-6 percent Zn^{2+} , and
- (3) the glass essentially comprises no arsenic and lead.

Again, the Examiner appears to focus only on the limitation that the glass comprises essentially no arsenic and lead and fails to address the fact that the claim also requires the glass to be a fluorophosphates glass. The combination of these two limitations is not found in Oguma.

The only glass sample in Oguma et al that appears to disclose any fluorine content is Example 17, and Example 17 contains both PbO and As₂O₃. There is no other specific example that has a fluorophosphate glass that does not contain PbO and As₂O₃. Thus, even though one of

criteria (1) and (3) is taught, the other is not taught and the two are not taught in combination. Further, the only sample in Oguma et al with a fluorine content does not have a glass with only 0-6 percent Zn^{2+} . The Zn content of Example 17 has a content of 18.6101 cation percent. Indeed, all of the examples have a Zn content well in excess of 6 cation percent. Thus, since all three limitations together now define the present invention, the claims should be patentable.

With respect to claims 1, 4 and 7 (as for Yamashita), the Examiner concedes that Oguma et al. fails to disclose the compositional and property limitations in terms of cation percent. However, the Examiner asserts that if the weight percent ranges in Oguma et al. were converted to cation percent, the ranges in Oguma et al. would overlap the claimed ranges. Based on the content of Chart 2 it is clear that no one of the 18 Examples has all of the recited components within the recited ranges. While one component may fall within the claimed range, the other components do not. Thus, there is no teaching or suggestion in Oguma et al that such composition comprising multiple components within specific ranges, as recited in independent claim 1, would exist.

Further, with respect independent claims 4 and 7, there is no composition recited, only physical parameters. To the extent that the Examiner is suggesting that common compositions in Oguma et al would yield common physical properties, the assertion must fail since the content of Chart 2 demonstrates that there are no such common compositions.

Finally, Applicants have added a recitation of the Zn content of the glass that clearly distinguishes over the high percentage of Zn taught in Oguma et al.

Claims 23, 29 and 34

Again, new claims 23, 29 and 34 include the limitations with regard to (1) the glass being a fluorophosphate glass (= phosphate glass containing fluorine) and (2) the glass essentially comprises no arsenic and lead. The claims should be patentable because this combination is not taught in Oguma et al and the cation percent ranges do not overlap, as demonstrated from the attached Chart 2. To the extent that the Examiner asserts that the characteristics of a fluorophosphates glass is not defined, Applicants now have specified that the F content of the

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glass is denoted by an anionic percentage of 25-48 percent. This feature, alone or in combination with other claimed features, is not found in Oguma et al.

Based on these three limitations in each of independent claims 23, 29 and 34, they should be considered patentable over Oguma et al. Similarly, dependent claims 24-28, 30-33 and 35-37 should be considered patentable over Oguma et al.

In short, the rejection over Oguma et al should be overcome for all claims.

Allowable Subject Matter

Applicants note with appreciation the Examiner's allowance of claims 17-22. However, Applicants respectfully submit that, on the basis of the clear text of independent claims 1, 4 and 7, as well as independent claims 23, 29 and 34, all of the remaining claims should be patentable since neither Yamashita nor Oguma teaches a glass satisfying the features now recited in the claims, as noted above.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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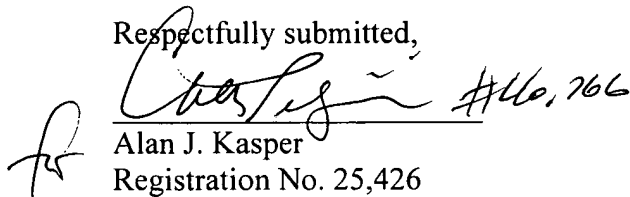
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